Replace lines 10-23 on page 5 and lines 1-6 on page 6 with the following:

-- SUMMARY OF THE INVENTION

The bulk of the cost of a packet switch is in the line cards. Hence the cost of inter-node line cards is a substantial overhead incurred in the deployment of a packet switching network instead of a single large packet switch. This invention presents two new routing schemes over a packet switching network so that the protocol processing at inter-node line cards is drastically simplified or even eliminated altogether, and the packet switching networks incorporating such methods.

In accordance with one broad method aspect of the present invention, a method for routing a packet through a network composed of a plurality of switches as nodes, the packet having a packet header containing routing information and destined to traverse the network via a route which is determined by a sequence of nodes, wherein the first of the sequence of nodes is the ingress node through which the packet enters the network, and the last of the sequence of nodes is the egress node through which the packet exits from the network, includes (a) in the ingress node of the network: (1) translating the routing information into the route encoded as a sequence of in-band control signals; (2) fragmenting the packet into cells of a fixed length; (3) and affixing the sequence of in-band control signals in front of each one of the cells, (b) in each one of the sequence of nodes on the route, including the ingress node and the egress node: (1) deploying a corresponding one of the sequence of the in-band control signals in front of each one of the cells to guide said each one of the cells through said each one of the sequence of nodes; and (2) consuming said corresponding in-band control signal from the

A3 Cont.

sequence of the in-band control signals of said each one of the cells; and (3) reassembling the cells into the packet in the egress node of the network.

In accordance with another broad method aspect of the present invention, a method for routing a packet through a network composed of a plurality of switches as nodes, each of the nodes having a switching fabric, the packet having a packet header containing routing information and destined to traverse the network via a route which is determined by a sequence of k nodes, $k \geq 1$, wherein the first of the sequence of nodes is the ingress node through which the packet enters the network, the last of the sequence of nodes is the egress node through which the packet exits from the network, includes (a) in the ingress node of the network: (1) translating the routing information into a first in-band control signal for the switching control over the switching fabric of the ingress node, a route tag, and a last in-band control signal for the switching control over the switching fabric of the egress node; (2) fragmenting the packet into cells of a fixed length; (3) affixing a cell header including said first in-band control signal, said route tag and said last in-band control signal in front of each one of the cells; (4) deploying said first in-band control signal in the cell header of each one of the cells to guide said each one of the cells through the ingress node; and (5) consuming said first in-band control signal from the cell header of said each one of the cells, (b) in the j-th node on the route, $2 \leq j \leq (k-1)$: (1) inserting a j-th in-band control signal into the cell header of each one of the cells for the switching control over the switching fabric of said j-th node on the route, wherein said j-th in-band control signal is derived from the route tag in the cell header of each one of the cells; (2) deploying said j-th in-band control signal in the cell header of each one of

the cells to guide said each one of the cells through said j-th node on the route; and (3) consuming said j-th in-band control signal from the cell header of each one of the cells, and (c) in the egress node of the network: (1) deploying the last in-band control signal for the egress node in front of each one of the cells to guide said each one of the cells through the egress node; and (2) reassembling the cells into the packet.

A3 cont.

Broad system aspects of the present invention are commensurate with these broad method aspects.--.

Page 10, replace line 20 as follows: --logical in-band-control switching fabric. Therefore, a single in-band-control switching fabric can be constructed by the interconnection of switching fabrics in all nodes by the inter-node links.--.

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Page 11, replace line 7 as follows: --typical transmission bandwidth over an electrical wire is typically only megabits per--.

Page 14, replace line 22 as follows: --of N–n times the length of a short in-band-control signal is appended at the end.--.

Page 15, replace line 11 as follows: --is N-1 times the normal length of an in-band-control signal.--

Page 15, replace lines 18-20 as follows: --networks with large values in N. This section presents another source-routing scheme, referred to as new hop-by-hop routing scheme, which is a modified version of the new source-routing scheme as presented in Section 1, where the overhead in cell formatting is independent of N. Note that the naming of this modified routing scheme as "hop-by-hop" has no relation with the "hop-

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